

Application Number 10/730,873
Amendment dated June 16, 2006
Responsive to Office Action mailed March 16, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): An implantable medical device comprising:
a plurality of interconnected modules, each of the modules comprising a respective one of a plurality of housings; and
an overmold that at least partially encapsulates each of the housings and includes a motion reduction element to reduce intermodule motion,
wherein a portion of the implantable medical device is tapered to provide a sloped transition between an edge of the implantable medical device and a surface of a patient, and an angle between the edge of the implantable medical device and the surface of the patient is greater than 90 degrees.

Claim 2 (Original): The implantable medical device of claim 1, wherein the overmold is flexible.

Claim 3 (Original): The implantable medical device of claim 1, wherein the overmold comprises an elastomeric material.

Claim 4 (Original): The implantable medical device of claim 3, wherein the elastomeric material is silicone.

Claim 5 (Original): The implantable medical device of claim 1, wherein the overmold comprises a non-elastomeric material.

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Claim 6 (Original): The implantable medical device of claim 5, wherein the non-elastomeric material is one of a polysulfone and a polyurethane.

Claim 7 (Previously Presented): The implantable medical device of claim 1, wherein the overmold comprises a first component that at least partially encapsulates each of the housings and a second component that is positioned to surround at least one of the housings.

Claim 8 (Original): The implantable medical device of claim 7, wherein the first component comprises an elastomeric material, and the second component comprises a non-elastomeric material.

Claim 9 (Cancelled).

Claim 10 (Original): The implantable medical device of claim 1, further comprising a lead connection module within the overmold for connecting an external lead to electronics within one of the plurality of interconnected modules.

Claim 11 (Original): The implantable medical device of claim 1, wherein the overmold comprises a first overmold, the implantable medical device further comprising a second overmold that at least partially encapsulates a lead connection module, wherein the second overmold is tethered to the first overmold.

Claim 12 (Previously Presented): The implantable medical device of claim 1, wherein an edge of the overmold is tapered to provide the sloped transition between the implantable medical device and the surface of the patient, and an angle between the edge of the overmold and the surface of the patient is greater than 90 degrees.

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Claim 13 (Previously Presented): The implantable medical device of claim 12, wherein the angle is within a range from 120 to 150 degrees.

Claim 14 (Original): The implantable medical device of claim 13, wherein the angle is approximately equal to 135 degrees.

Claim 15 (Previously Presented): The implantable medical device of claim 1, further comprising sloped interface element, separate from the overmold, that surrounds the overmold and provides the sloped transition between the implantable medical device and the surface of the patient, wherein an angle between an edge of the sloped interface element and the surface of the patient is greater than 90 degrees.

Claim 16 (Original): The implantable medical device of claim 15, wherein the angle is within a range from 120 to 150 degrees.

Claim 17 (Original): The implantable medical device of claim 16, wherein the angle is approximately equal to 135 degrees.

Claim 18 (Original): The implantable medical device of claim 1, wherein the overmold is concave to conform substantially to a cranium of a patient.

Claim 19 (Original): The implantable medical device of claim 1, wherein the overmold is molded prior to implantation to conform substantially to a cranium of a patient.

Claim 20 (Original): The implantable medical device of claim 1, wherein the overmold includes durometer specific material.

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Claim 21 (Original): The implantable medical device of claim 1, wherein the overmold comprises a material having a high thermal conductivity to act as a heat sink for thermal energy generated within the modules.

Claim 22 (Original): The implantable medical device of claim 1, wherein the overmold comprises a material having a low thermal conductivity to act as a shield of thermal energy generated within the modules.

Claim 23 (Previously Presented): The implantable medical device of claim 1, wherein the overmold includes an external lead management structure for external leads being routed away from the implantable medical device.

Claim 24 (Original): The implantable medical device of claim 23, wherein the overmold includes a groove to hold external lead material.

Claim 25 (Original): The implantable medical device of claim 23, wherein the overmold includes a pouch to hold external lead material.

Claim 26 (Original): The implantable medical device of claim 1, wherein the overmold includes a removal assist structure for assisting in removal of the implantable medical device.

Claim 27 (Original): The implantable medical device of claim 1, wherein the overmold includes a through-hole to receive an attachment mechanism for attaching the implantable medical device to a patient.

Claim 28 (Original): The implantable medical device of claim 1, further comprising a radio-opaque marker within the overmold.

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Claim 29 (Original): The implantable medical device of claim 1, wherein the overmold is impregnated with a therapeutic agent.

Claim 30 (Previously Presented): The implantable medical device of claim 1, wherein the implantable medical device is implanted on a cranium of a patient, and the overmold includes a cap to cover a hole through the cranium.

Claim 31 (Original): The implantable medical device of claim 1, wherein at least one of the modules provides neurostimulation therapy to a patient.

Claim 32 (Currently Amended): An implantable medical device comprising:
a plurality of modules with respective housings; and
an overmold that at least partially encapsulates each of the housings and includes a motion reduction element to reduce intermodule motion, wherein the overmold comprises a first component that at least partially encapsulates the housing and a second component that is positioned to surround the housing, the first component comprises elastomeric material, and the second component comprises a non-elastomeric material.

Claim 33 (Original): The implantable medical device of claim 32, wherein the overmold is flexible.

Claim 34 (Original): The implantable medical device of claim 32, wherein the elastomeric material is silicone, and the non-elastomeric material is one of a polysulfone and a polyurethane.

Claim 35 (Cancelled).

Claim 36 (Currently Amended): The implantable medical device of claim ~~35~~ 32, wherein the second component includes the motion reduction element.

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Claim 37 (Original): The implantable medical device of claim 32, further comprising a lead connection module formed within the overmold for connecting an external lead to electronics the housing.

Claim 38 (Previously Presented): The implantable medical device of claim 37, wherein the second component forms at least a part of the lead connection module.

Claim 39 (Previously Presented): The implantable medical device of claim 32, wherein an edge of first component is tapered to provide a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

Claim 40 (Previously Presented): The implantable medical device of claim 39, wherein the angle is within a range from 120 to 150 degrees.

Claim 41 (Original): The implantable medical device of claim 40, wherein the angle is approximately equal to 135 degrees.

Claim 42 (Original): The implantable medical device of claim 32, further comprising sloped interface element that surrounds the overmold and provides a sloped interface with a surface of a patient, and an angle between the edge and the surface of the patient is greater than 90 degrees.

Claim 43 (Original): The implantable medical device of claim 32, wherein at least one of the first and second components of the overmold is concave such that the overmold conforms substantially to a cranium of a patient.

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Claim 44 (Previously Presented): The implantable medical device of claim 32, wherein the second component includes a through-hole to receive an attachment mechanism for attaching the implantable medical device to a patient.

Claim 45 (Original): The implantable medical device of claim 32, wherein implantable medical device provides neurostimulation therapy to a patient.

Claim 46 (Cancelled).

Claim 47 (Currently Amended): An implantable medical device, comprising:
a plurality of interconnected modules, each of the modules comprising a respective one of a plurality of housings; and
means for integrating the modules into a single structure that at least partially encapsulates each of the housings,
wherein the means for integrating comprises means for reducing intermodule motion and
is tapered to provide a sloped transition between an edge of the means for integrating and a surface of a patient, and an angle between the edge of the means for integrating and the surface of the patient is greater than 90 degrees.

Claim 48 (Original): The implantable medical device of claim 47, wherein the means for integrating is flexible.

Claim 49 (Original): The implantable medical device of claim 47, wherein the means for integrating comprises a means for providing flexibility for the implantable medical device and a means for providing structural integrity for the implantable medical device.

Claim 50 (Cancelled).

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Claim 51 (Original): The implantable medical device of claim 47, wherein the means for integrating comprises means for connecting an external lead to electronics within one of the plurality of interconnected modules.

Claim 52 (Cancelled).

Claim 53 (Original): The implantable medical device of claim 47, wherein the means for integrating comprises means for holding external lead material.

Claim 54 (Original): The implantable medical device of claim 47, wherein the means for integrating comprises means for facilitating removal of the implantable medical device.

Claim 55 (Previously Presented): The implantable medical device of claim 47, wherein the means for integrating comprises means for receiving an attachment mechanism for attaching the implantable medical device to a patient.

Claim 56 (Currently Amended): A method for fabricating a modular implantable medical device, the method comprising:

- fabricating a plurality of modules, each of the modules comprising a respective one of a plurality of housings;

- fabricating a non-elastomeric component to surround at least one of the housings;

- fabricating an elastomeric component to at least partially encapsulate each of the housings and the non-elastomeric component;

- fabricating a motion reduction element to be positioned within the elastomeric component and reduce intermodule motion; and

- combining the elastomeric component, non-elastomeric component, motion reduction element and plurality of modules to construct the modular implantable medical device.

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Claims 57-59 (Cancelled).

Claim 60 (Previously Presented): The method according to claim 56, wherein the elastomeric component provides an overall shape and flexibility of modular implantable medical device.

Claim 61 (Previously Presented): The method according to claim 56, wherein the non-elastomeric component provides structural integrity for modular implantable medical device.

Claim 62 (Previously Presented): The implantable medical device of claim 15, wherein the sloped interface element comprises at least one of a flexible band, an o-ring, a removable flexible flange, or a tapered outer contour element.

Claim 63 (Previously Presented): The implantable medical device of claim 1, wherein the surface of the patient is the cranium.

Claim 64 (Previously Presented): The implantable medical device of claim 39, wherein the surface of the patient is the cranium.

Claim 65 (Previously Presented): The implantable medical device of claim 42, wherein the surface of the patient is the cranium.

Claim 66 (Previously Presented): The implantable medical device of claim 47, wherein the surface of the patient is the cranium.